

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,921,482 B1
APPLICATION NO. : 09/889961
DATED : July 26, 2005
INVENTOR(S) : Cheng et al.

Page 1 of 13

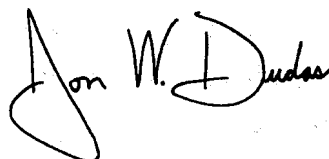
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

THE TITLE PAGE SHOWING ILLUSTRATIVE FIGURE, SHOULD BE DELETED
AND SUBSTITUTE THEREFORE THE ATTACHED TITLE PAGE

DELETE DRAWING SHEETS 1-11 AND **SUBSTITUTE** THEREFORE THE
DRAWING SHEETS CONSISTING OF FIGS 1-11 AS SHOWN ON THE
ATTACHED PAGE.

Signed and Sealed this

Twenty-first Day of August, 2007

A handwritten signature in black ink, appearing to read "Jon W. Dudas". The signature is stylized with a large, looped initial "J" and a distinct "D".

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Cheng et al.

(10) Patent No.: **US 6,921,482 B1**
(45) Date of Patent: **Jul. 26, 2005**

(54) **SKINNED HOLLOW FIBER MEMBRANE
AND METHOD OF MANUFACTURE**

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/889,961

(22) PCT Filed: Jan. 27, 2000

(86) PCT No.: PCT/US00/02194

§ 371 (c)(1).

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(87) PCT Pub. No.: WO00/44482

PCT Pub. Date: Aug. 3, 2000

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1999.

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(52) U.S. Cl. 210/500.23; 210/500.36;
210/500.27; 210/640; 210/321.8; 95/46;
264/41

(58) Field of Search 210/500.36, 500.27,
210/500.23, 490, 321.8; 264/41; 427/244;
96/4; 95/45, 46

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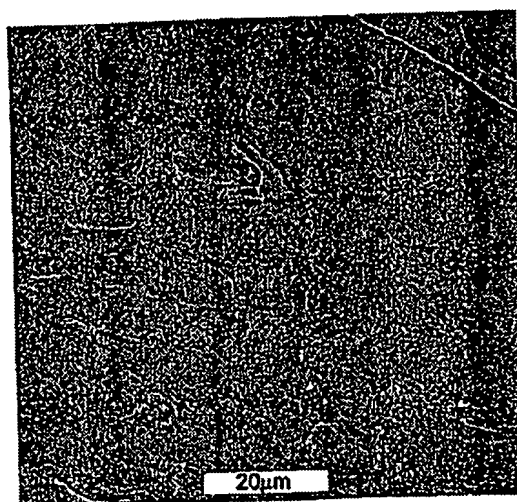
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(57) **ABSTRACT**

Hollow fiber membranes having a skinned surface on one
diameter, and a porous surface on the opposite diameter arm
produced from perfluorinated thermoplastic polymers by
extruding a heated solution of the polymer having a lower
critical solution temperature directly into a cooling bath to
form the porous membrane by liquid-liquid phase separation.
Extrusion can be conducted either vertically or hori-
zontally. The hollow fiber membranes are useful as ultrafil-
tration membranes and as membrane contactors.

18 Claims, 11 Drawing Sheets



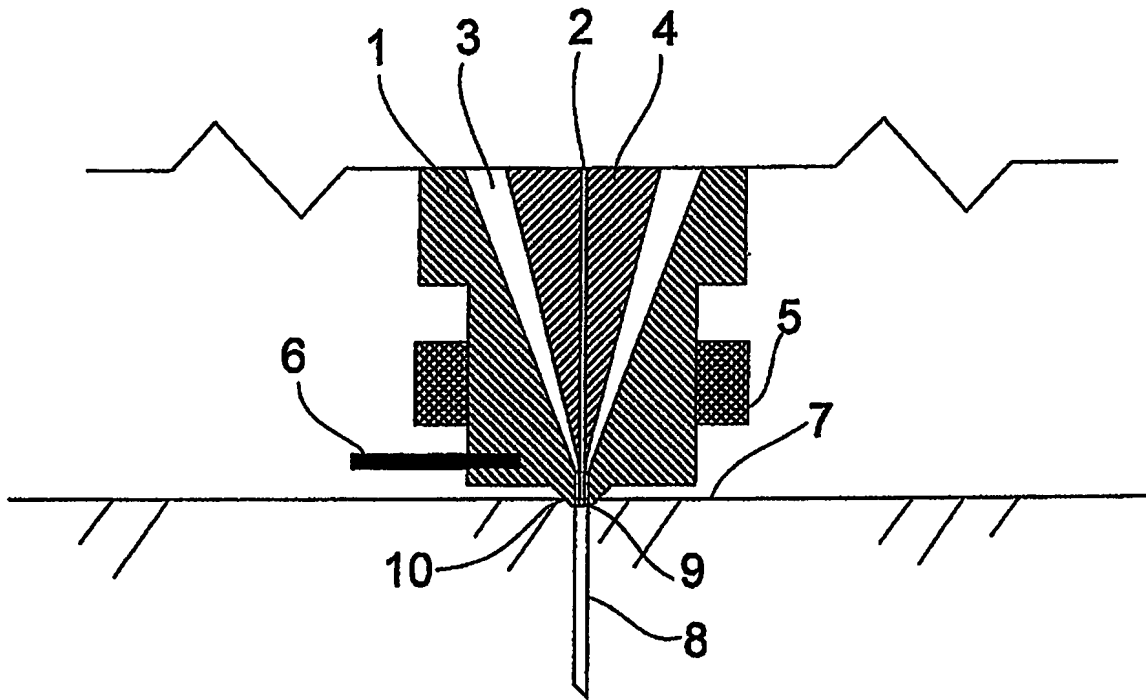


Fig.1

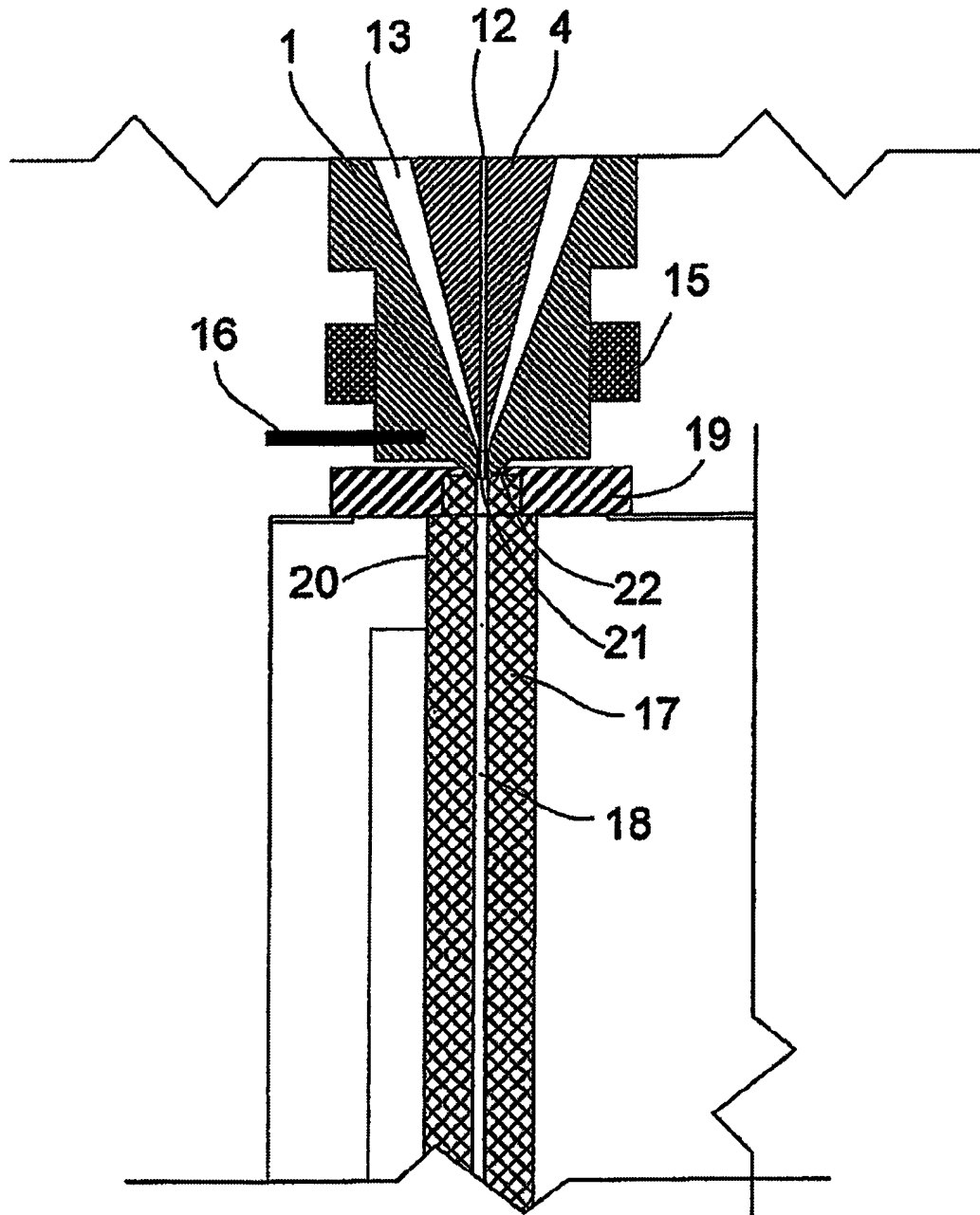


Fig.2

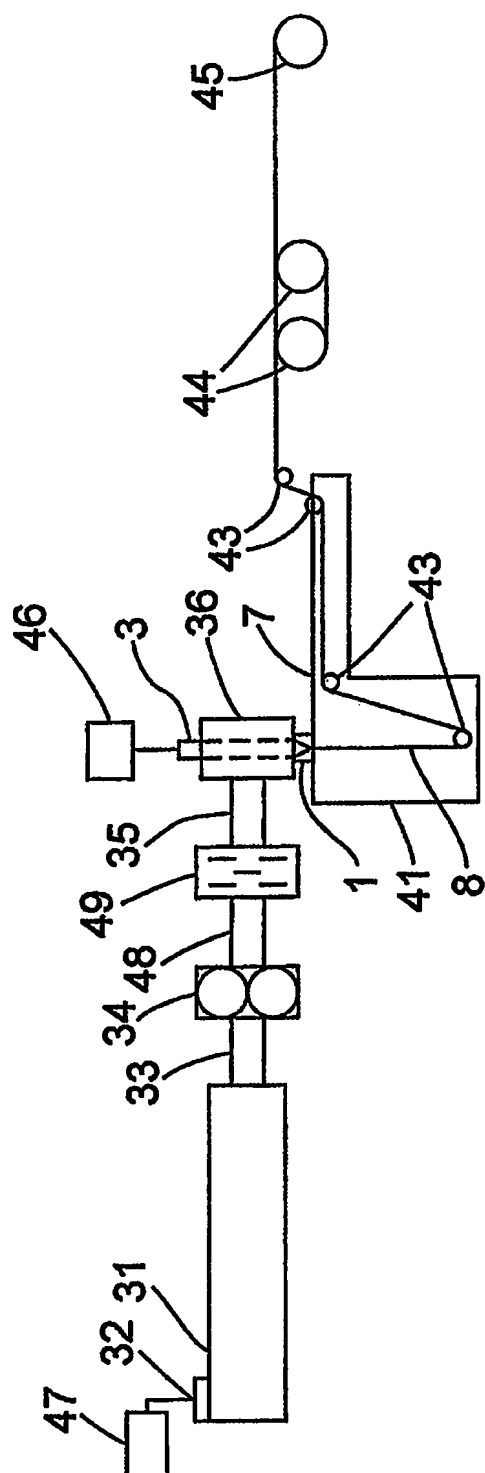


Fig. 3

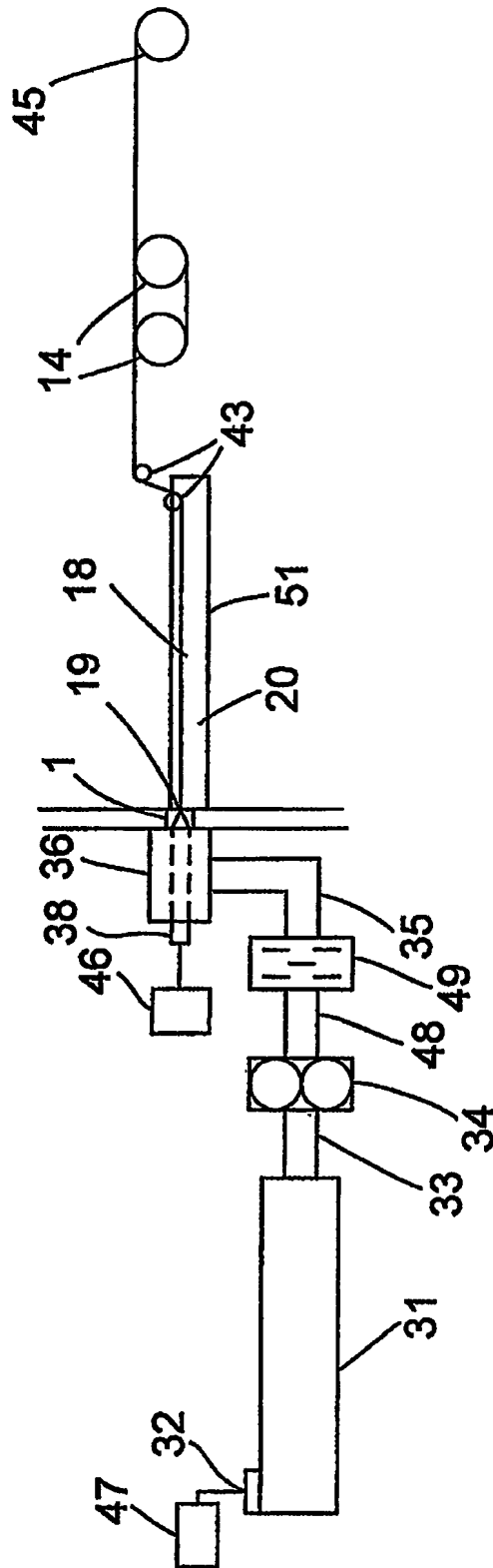


Fig. 4

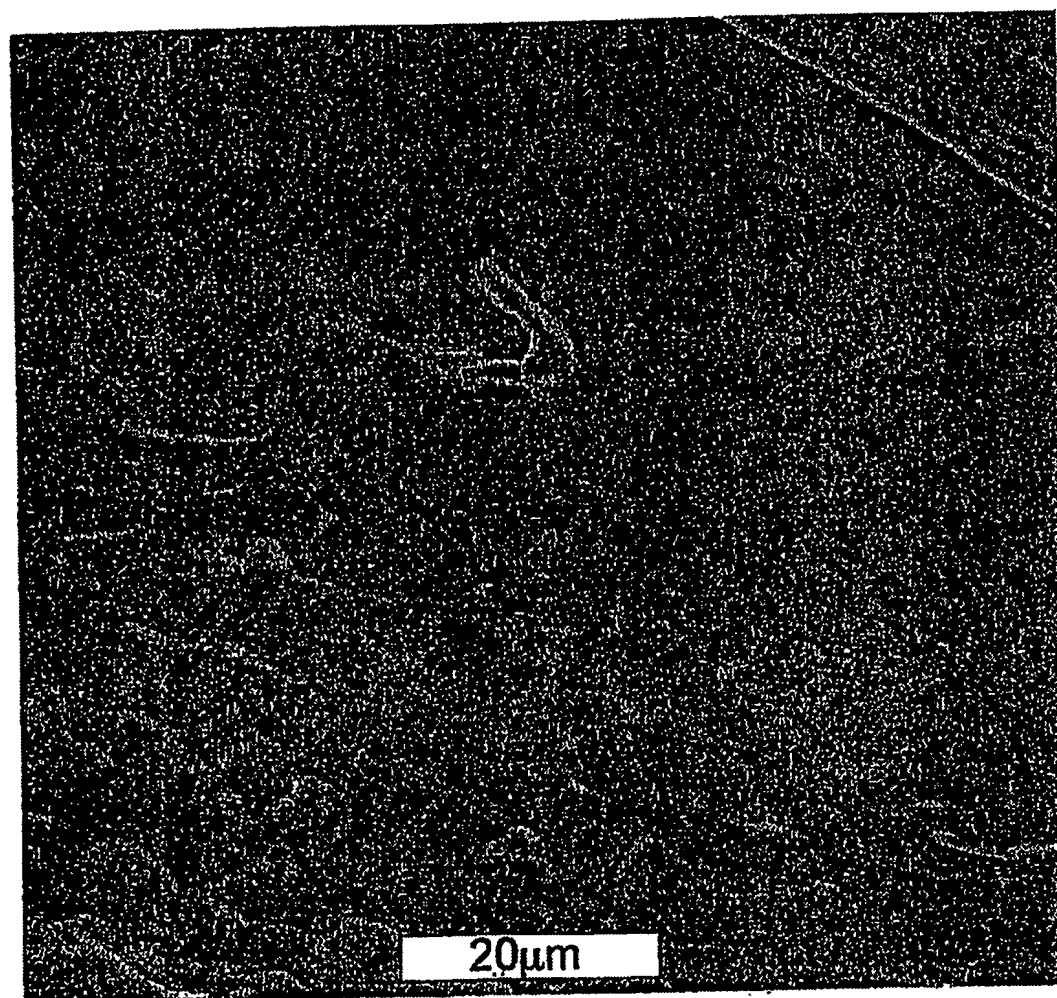


Fig.5

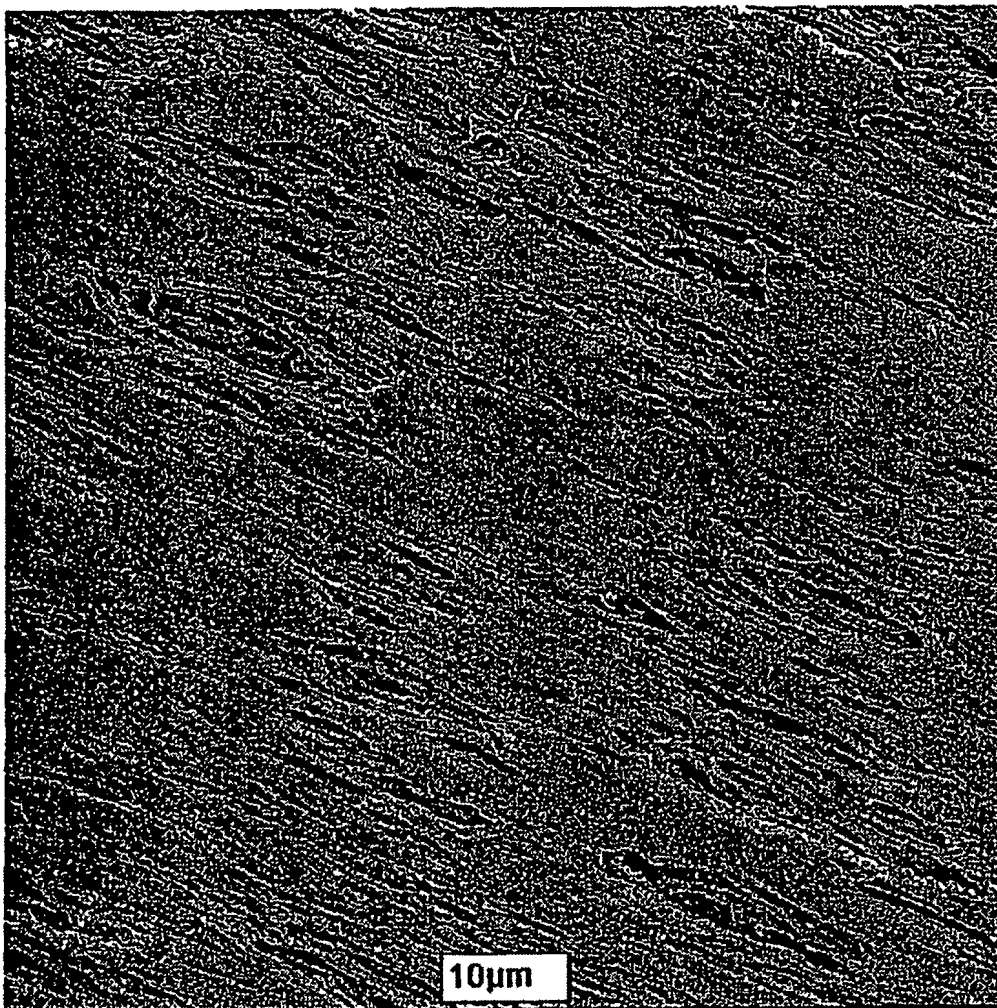


Fig.6

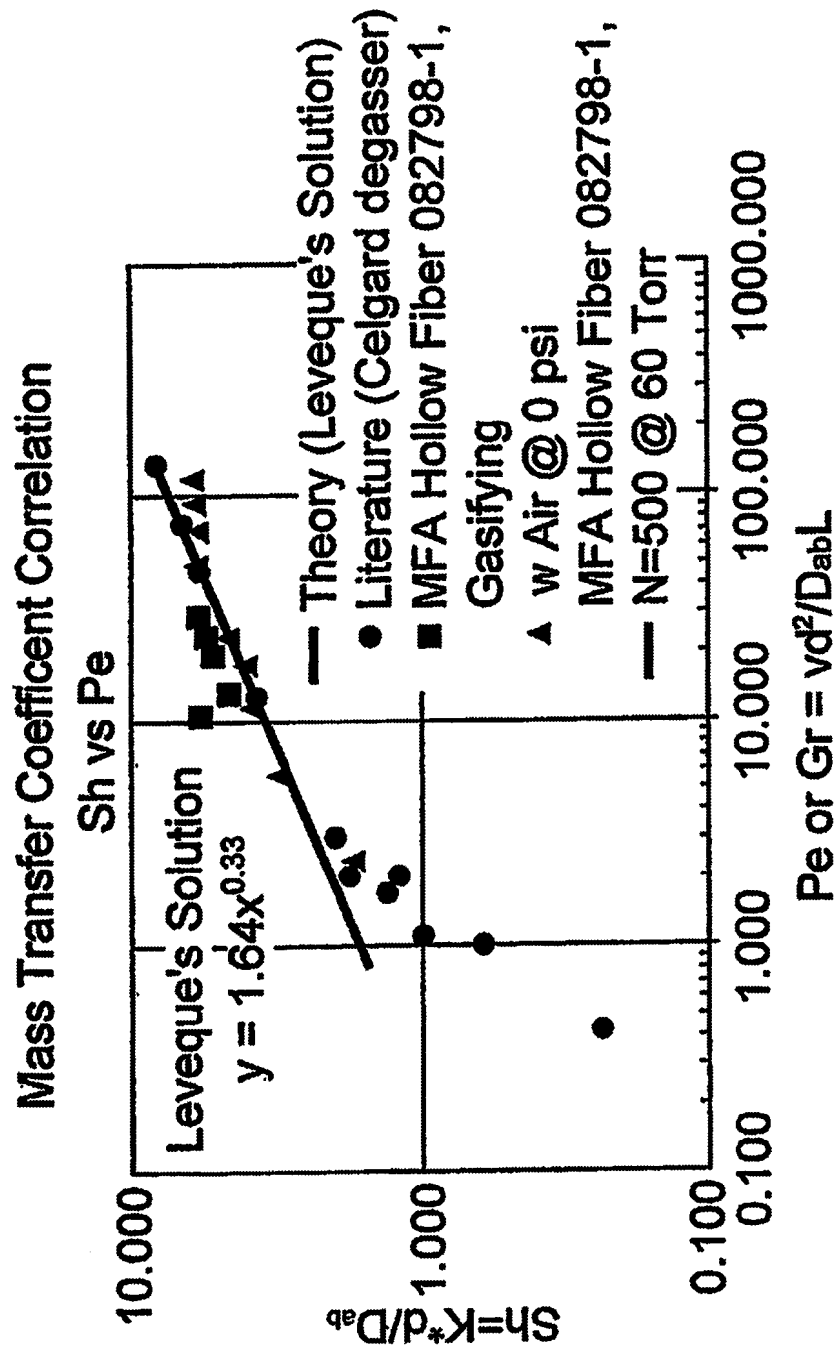


Fig.7

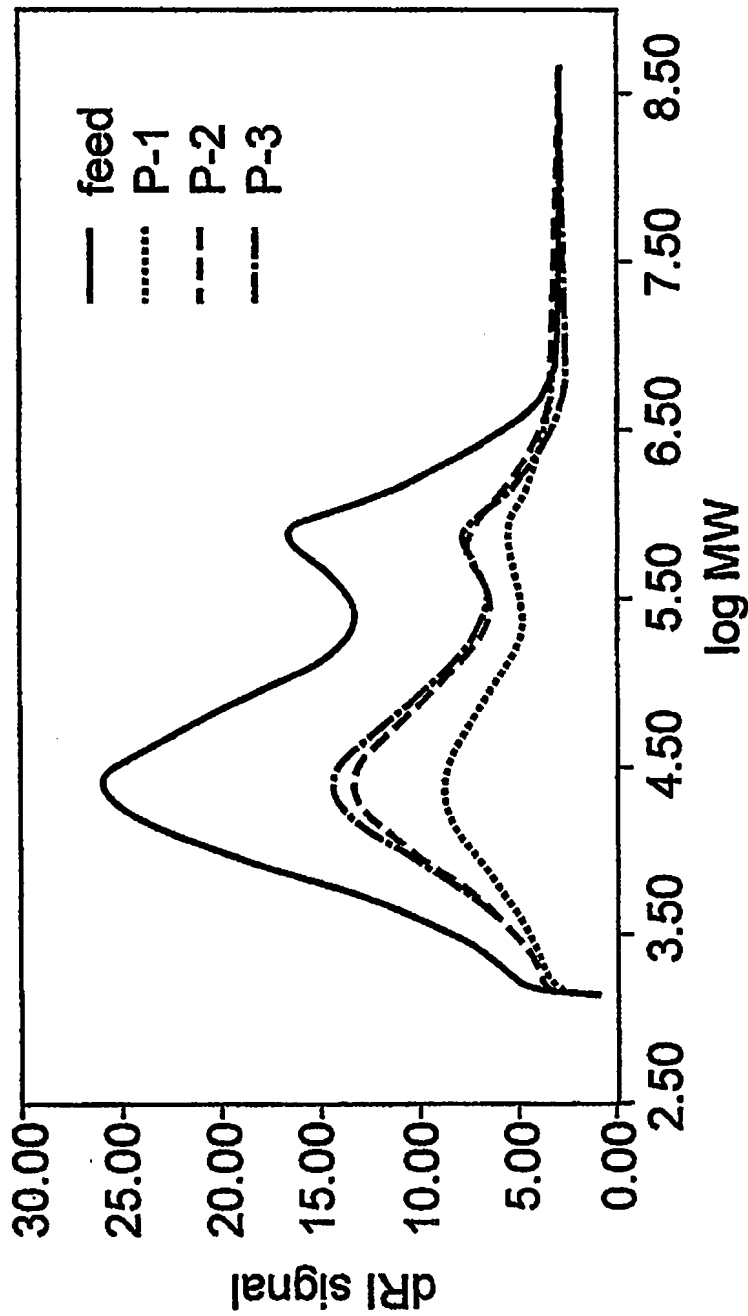


Fig.8

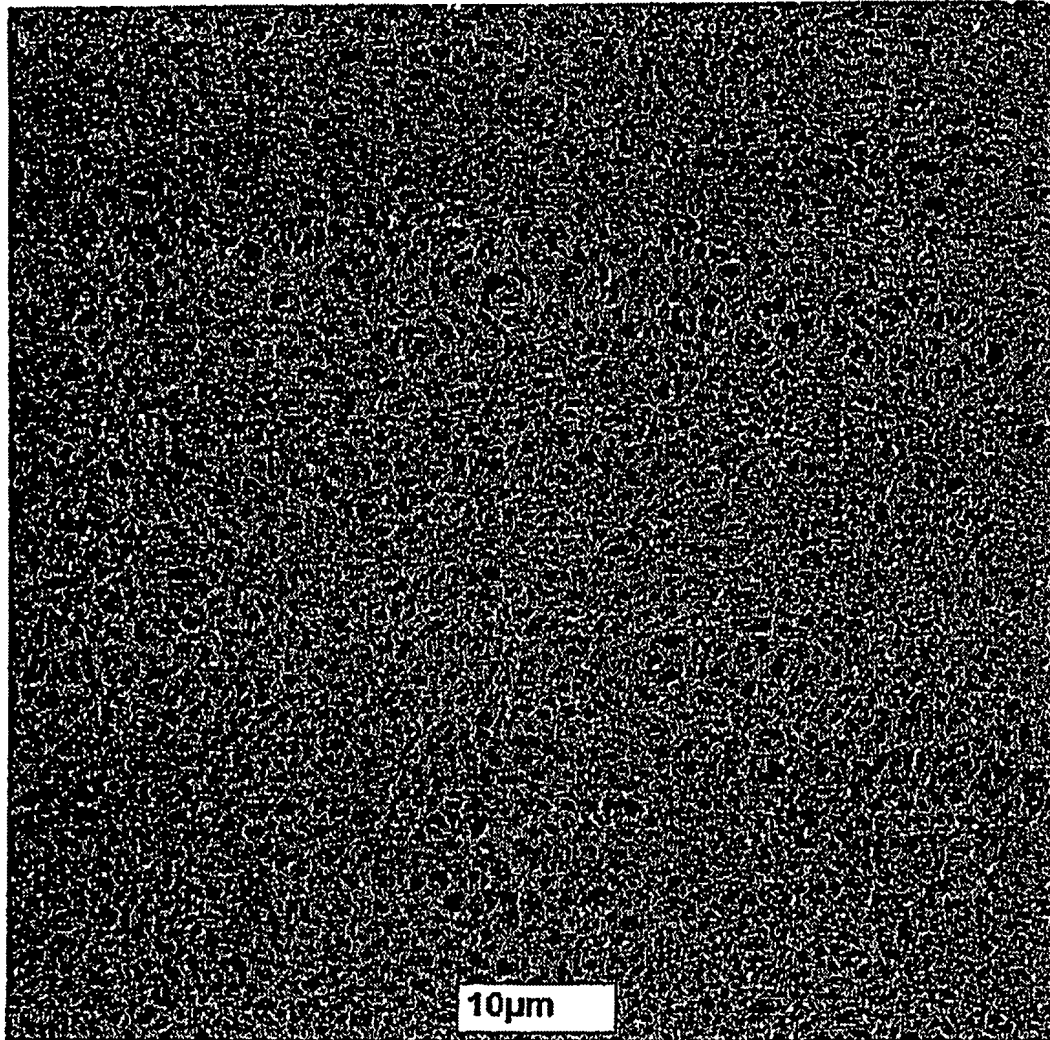


Fig.9

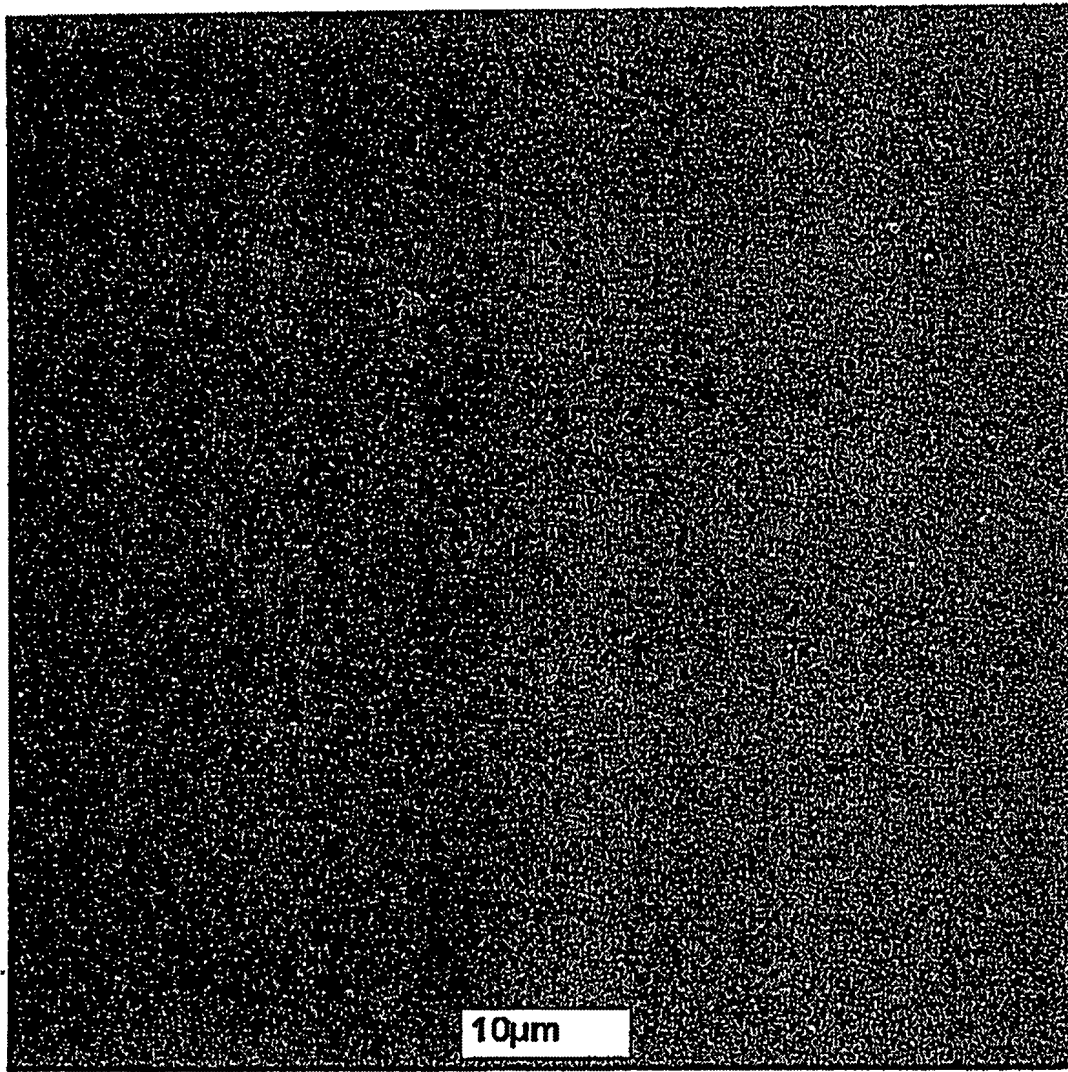


Fig.10

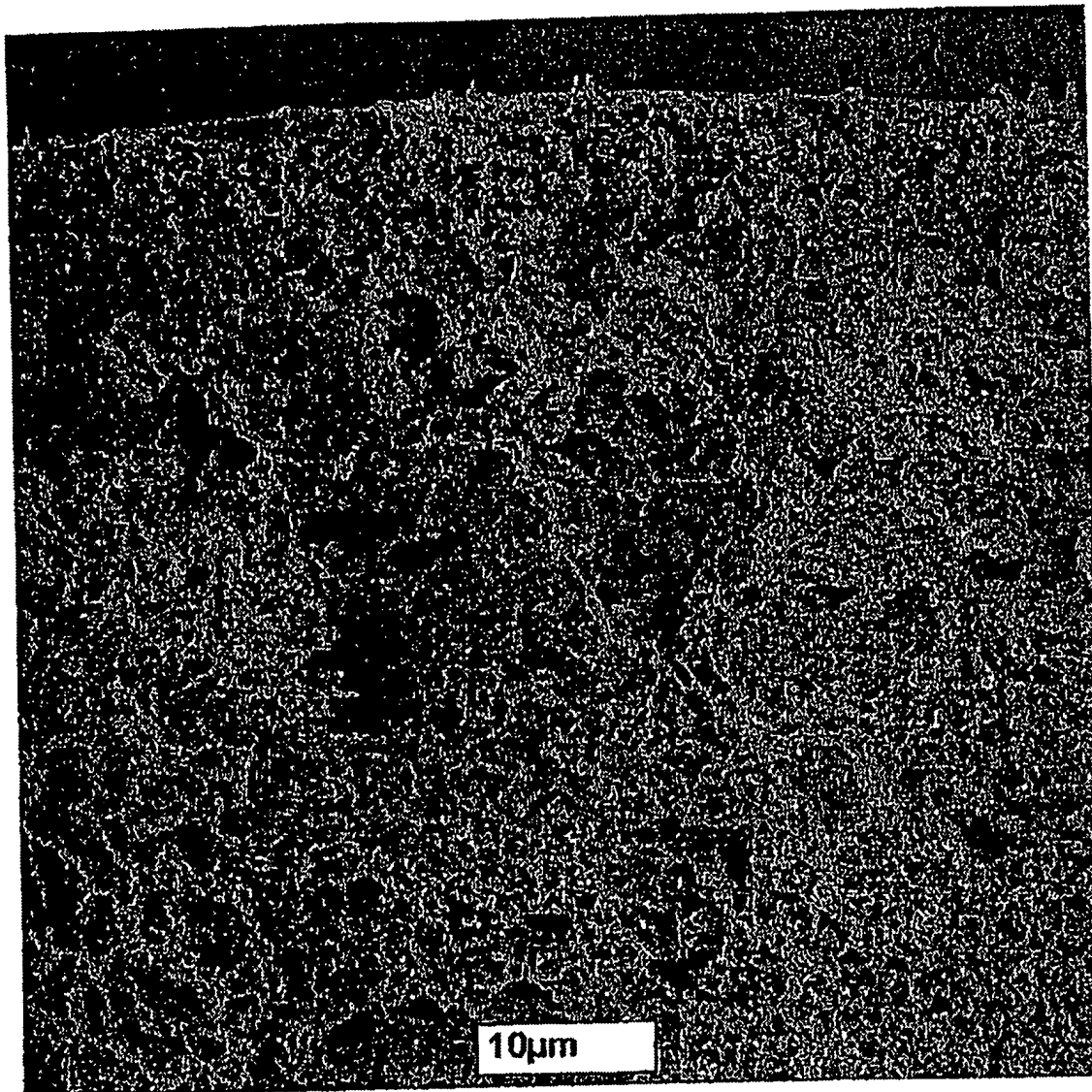


Fig.11